UNITED STATES PATENT APPLICATION

OF

Larry Cohen,

Paul McDonald,

and

William J. Ashcraft

FOR

FACSIMILE FORM GENERATION SYSTEM

This application claims the benefit of provisional application "Facsimile Form Generation," filed November 28, 1995, bearing Serial No. 60/007,645, the contents of which are relied upon and incorporated by reference.

BACKGROUND OF THE INVENTION

5

Field of Invention

The present invention relates to a document preparation and delivery system, and more particularly to a system and method for preparing and sending documents via facsimile to a plurality of customers, each customer document having a plurality of

10 unique data values.

Although applicable for many applications, the present invention is particularly suitable for stock brokerage and security firms and will be described in that connection.

Description of the Related Art

Many businesses require sending information to clients on a regular basis and in

15 a very timely manner. For example, in the stock brokerage and securities area, a brokerage firm is required by law to send confirmation of stock trades to their clients in less than one calendar day. Because the cost of overnight mail carriers is prohibitive, other options such as facsimile delivery are used.

However, it is extremely time consuming for a firm to prepare and send via

20 facsimile a large number of documents to a plurality of different telephone numbers. In one system, a facsimile vendor stores a customer form. Then the securities firm sends in data which is typed at distinct locations to fit the form. That is, for example, the name to be placed in the "to" field is positioned on the client's screen in the exact position it

will be on the form. If there are a plurality of blank lines then a plurality of blank lines

will be sent. This requires a great deal of data to be sent from the client to the fax

vendor, who then superimposes the data over the stored form and transmits the

facsimile to a plurality of different customer sites. Accordingly, this prior system

5   required that a securities firm send a large amount of data to a fax vendor and spend a

great deal of time preparing and formatting the data.

In light of the foregoing, there is a need for a facsimile system where the firm

may send a minimal amount of information in a simplified format to a fax vendor, saving

both time and money for the securities firm.

10

SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to a computer readable medium

that includes data corresponding to a pre-formatted form having a group of fields

arranged at designated locations on the form, and having instructions configured to

15   extract information from received data that includes a key value section and a data

section. The key value section defines the order of the field data that will follow in the

data section. The fields in a form are populated with the received data in the

corresponding fields defined by the key value section. The data section may include

data for a plurality of separate forms.   Common data information that is to be included

20   in each form may be defined in the key value section and inserted in each form to be

transmitted.

In another aspect, a system for facsimile transmission of documents includes a

memory for storing a form with a plurality of fields, structure for receiving data identifying a pre-formatted form having fields, data defining a sequence that data will be sent for insertion into fields in the pre-formatted form, structure for populating the fields with received data and then transmitting the generated facsimiles.

5   In another aspect, a method for preparing documents for facsimile transmission includes the steps of receiving sets of data from an external device that each corresponds to a stored pre-formatted form. The data values in each data set are used to populate a form to generate a completed document. The completed documents are output via facsimile.

10

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated and constitute part of the specification, illustrate a presently and preferred implementation of this invention and, together with the general description given above and the detailed description of the

15   preferred implementation given below, serve to explain the principles of the invention. In the Drawings:

Fig. 1 is a block diagram of a system for preparing documents for facsimile transmission according to the present invention;

Fig. 2A shows an example of a pre-formatted form that may be used by the

20   system of Fig. 1;

Fig. 2B shows an example of a completed form generated by the system of Fig. 1;

3

Fig. 3 is a flow chart of the steps required to configure the system for the preparation of facsimile documents for transmission by the system of Fig. 1; and

Fig. 4 is a flow chart of the steps for processing received data to generate documents for facsimile transmission by the system of Fig. 1 configured according to

5   Fig. 3.

DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the construction and operation of a preferred implementation of the present invention which is illustrated in the accompanying drawings. The following description of the preferred implementation of

10   the present invention is only exemplary of the invention. The present invention is not limited to this implementation, but may be realized by other implementations.

Fig. 1 illustrates one implementation of the present invention. The data input device 100 inputs data to a computer system 120 that includes processor 130, computer readable medium 140, input data storage 150, initial processing instructions

15   160, instructions for processing received data strings to generate completed forms 170, and instructions for outputting processed forms 180. The computer system may output information through a facsimile device 190. The computer readable medium may be a computer memory or any other computer readable device.

The input data storage 150 stores data corresponding to a pre-formatted form

20   having a group of fields at designated locations in the pre-formatted form. The example pre-formatted form is shown in Fig. 2 and has a title, F&M Securities, a field 1 for insertion of a name, a field 2 for insertion of account information, a field 3 for insertion

4

of stock information, and a field 4 for insertion of a message. The initial processing

instructions 160 include instructions for receiving and storing information about pre-

formatted forms in the input data storage 150.

Initially customer companies such as F&M Securities, supply a business form to

5   the facsimile vendor such as that shown in Fig. 2A, and a sample of how the form

should appear after being printed such as that shown in Fig. 2B. Fig. 3 shows the steps

for creating the initial forms that are stored in the input data storage 150. The blank

titled form is received (step 300), and a sample of the completed form such as that

shown in Fig. 2B is received (step 310). A unique field identifier must be provided for

10   each field in the form (step 320). The title of the form, or some other designated

identifier is stored as a template identifier (step 330). An image of the form is stored as

an overlay (step 340). The image of the form may be generated by drawing the

document to scale using page layout software such as FrameMaker made by Adobe

running on an operating system such as Solaris made by Sun Microsystems, Inc. The

15   present invention utilizes a script, which is a program that describes how text and

graphics are to be combined with one or more overlays to produce a document. The

script includes instructions for where to place each field on an overlay and includes

formatting information defining how data is to be placed and appear in each field. For

example, the script will define the location of the name field on the document page and

20   may describe a location of fields in relation to one another. An overlay is a one page

pre-stored raster image used as a background on a fax with form data, and a template

is a collection of a script and zero or more overlays.

A script may be created using a basic understanding of programming languages and using any programming language such as Xbase, dBase, Clipper, LISP, BASIC and Microsoft's Visual Basic.

The script is compiled (step 360) and, when the compilation is determined to be successful, the script and overlay are stored together as a template (step 370). Otherwise an error message is output to the user of computer system 210 (step 375). The compiling step is the most time consuming step. Therefore, it is desirable to pre-compile the script or to place the compiler on another computer system separate from computer system 210.

After templates have been stored in the input data storage 150, a customer may download data to the present invention in a variety of ways using communication programs such as ProComm communications software produced by Quarterdeck Inc. (step 400). The instructions for processing received data strings 170 parse through received data strings from data input device 100, and populate a group of fields in an identified pre-formatted form. The following is an example of a received data string having a keyword value section and a data section:

Keyword Value Section

    Template: F&M_Securities
    DDEFINITION: FAX, NAME, ACCT, STOCK
    CDEFINITION: MESSAGE

Data Section

The latest stock trade information.	*(Common Data)*
202-123-4567; John Smith, 56789, Cable: $35879;	*(Data Set 1)*
202-124-5678; Jennifer Thomas, 54321, Enterprise: $40000;	*(Data Set 2)*

6

Computer system 120 receives the data and processor 130 extracts a keyword

value section (step 410). Computer system 120 first determines whether the template

identified exists (step 415). If not, an error message is output to the user (step 418).

Otherwise, the identified template is retrieved (step 420). The script associated with the

5   identified template is stored in a local work space in the computer system 120 (step

430). Form overlays associated with the identified template is loaded into the local

work space of the computer system 120 as they are referenced by the script (step 440).

Data definitions (DDEFINITIONS) and common data definitions ·

(CDEFINITIONS) that are included in the keyword value section are extracted (step

10   450). The DDEFINITIONS provides a list of comma separated field names that are in

the form. In one embodiment, the first few field names in the DDEFINITION are

reserved names for information such as a phone number destination for a facsimile.

The CDEFINITION lists comma separated field names that will contain common data.

For example, if a firm wishes to include the same message of the day in each facsimile,

15   this message of the day will be inserted in the section referred to as common data. The

data section includes data pieces separated by commas. Each data piece corresponds

to a field on the identified corresponding form. The list of fields in the CDEFINITION

and DDEFINITION defines the order of the data in the data section.

In the example above, the CDEFINITION indicates that the message field 4 of

20   each form to be defined in the data section will contain the same message. The data

section begins with data for insertion in the common data fields defined in the

CDEFINITION. The DDEFINITION shown above indicates that each data set will list a

7

fax number followed by a name for field 1, account number for field 2, and stock information for field 3.

The data section includes two data sets after the defined common data, each set corresponding to a different form. The sets are distinguished by being on different lines or by a character such as ";" or "/." In the example, there are two data sets, one data set corresponding to a form to be sent to John Smith and the other data set corresponding to a form to be sent to Jennifer Thomas. Each set includes a data piece corresponding to each field listed in the DDEFINITION. The data pieces are separated by a character such as a comma, but any predefined character may be used. If the data has an embedded comma, it must be framed with another character such as quote marks, such as "Arlington, Virginia." The DDEFINITION shown above indicates that the data pieces will first list a facsimile number followed by a name field, an account field, and a stock field. If a field is to be left black, then two separators, such as the separator comma shown, will be listed in a row.

Computer system 320 determines whether the number of data values provided in each data set correspond to the number of identifiers provided in the combined CDEFINITION and DDEFINITION areas (step 412). If not, an error message is output to the user (step 418). Otherwise, based on the DDEFINITION, the first data piece from the first line of data of the first set of data is inserted in the associated field of the form (step 460). The computer system 120 determines whether there are additional data pieces in the data set (step 465). If so, the next piece of data, which belongs in the next identified field, will be inserted (step 470). When it is determined that there are no

8

additional data pieces in the data set (step 465), then data provided in the

CDEFINITION is inserted in the appropriate field in the form. In the example, the

message "The latest stock trade information." is inserted in the message field of every

form generated. The completed form that includes all of the data given by the user will

5   be stored as a completed form (step 480).

If it is determined that there is another set of data (step 485), then the first data

piece in that set is inserted into an associated field of the next form (step 490), where

each set of data corresponds to another distinct form document. When it is determined

that there are no additional sets of data to be processed (step 485), then processing is

10   complete and the set of completed documents are sent via facsimile to the facsimile

number associated with each (step 495). If a facsimile number is busy or out of paper,

the computer system 120 will repeatedly attempt to send the document until a

successful connection is achieved.

In one implementation of the present invention, a customer may designate

15   special processing at the time the script is developed in order to provide additional

functions. For example, the customer may indicate that certain fields in the form will

have a plurality of values. In the example shown in Fig. 2A, the customer may wish to

provide a plurality of stock transactions and may wish to have the stock field repeated

on the completed form. The script will include instructions for checking for a specific

20   flag or character such as ";" which will be inserted in between values to indicate that

each of the values belongs in the same field. If, at the time of initializing a script, a

customer knows that a certain data field will have a plurality of data values, the script

9

may be written with instructions to check for the plurality of data values and to either insert the many data values on one page or on additional pages as required.

Another type of special processing is to require that some customers receive a different overlay than others in which case the script will include instructions to check

5   for a specific character that indicates to use an alternate overlay for this form.

A user may request that a certain field have text in bold, in which case the script will look for a character to indicate which fields are to be placed in bold for a specific customer, such as by placing a ";" in between values for the same field.

A user may wish to have a string of data printed on one line on the facsimile

10   document but desire to enter the data on different lines in the data section of the download, in which case a special character may be placed at the end of the line before a return to indicate that the next line of data should continue with the current line of data. These are examples of the many types of special processing a user may desire that can be accomplished by altering the script of the present invention.

15   In one implementation of the present invention there are many distributed computer sites that include the software on computer system 120. The site closest to the destination of the facsimile should be used to compile the documents in order to save transmission costs.

While there has been illustrated and described what are at present considered to

20   be a preferred embodiment and method of the present invention, it will be understood by those skilled in the art that various changes and modifications may be made, and equivalents may be substituted for elements thereof without departing from the true

10

scope of the invention. Modifications may be made to adapt a particular element, technique, or implementation to the teachings of the present invention without departing from the spirit of the invention. Therefore, it is intended that this invention not be limited to the particular embodiment and method disclosed herein, but that the invention

5   include all embodiments falling within the scope of the appended claims.